

AVIATION

The Oldest American Aeronautical Magazine

MARCH 2, 1929

Issued Weekly

PRICE 20 CENTS



Comdr. E. E. Wilson aloft in a "Wasp" powered Boeing F3B fighter.

VOLUME
XXVI

Special Features

The Todd Monoplane
Watercooled Aircraft Engines
Activities of the Aero Chamber of Commerce

NUMBER
9

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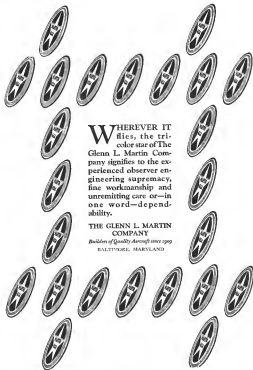
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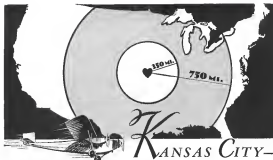
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THANK YOU for mailing AVIATION

Capt. Hawks and "Wasp" set new record!



The Texas Company
Texaco Petroleum Products



Feb 6 1929

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Dear Sirs:

Against most unfavorable weather, rain, snow, sleet and cold temperature your "Wasp" motor functioned perfectly. It was a great pleasure to ride behind such a splendid piece of mechanism on my little flight from Los Angeles to New York in which the record was broken.

Yours sincerely,
Frank M. Hawks



TS now eighteen hours, twenty-one minutes, fifty-one seconds from Los Angeles to New York in the "Wasp" speeds the 7,700 miles in two hours in the transcontinental run up.

through storm-torn February skies, Captain Frank M. Hawks and mechanic, Oscar E. Grubb, with a "Wasp" powered Lockheed Air Express, recently cut 30 minutes from the former record.

PRATT & WHITNEY AIRCRAFT CO.
HARTFORD, CONNECTICUT

Wasp & Hornet Engines

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Complete information on any Du Pont product for airplane use will be furnished promptly by mail or by a qualified representative.



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Your cockpit and cabin need the unusual beauty and durability of Fibreless, the perfect aircraft upholstery material. The designs of the new light-weight Niquequa Aero-

plane Fibreless for cabin ships passing the buoyancy, luxury, and gaiety of the modern mode of travel.

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Newburgh, New York

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THANK YOU for making AVIATION

17-year-old girl sets flight mark using Kendall Penzbest Oil



ELMER SMITH
in cockpit of his
Kendall Penzbest Oil plane

February 1, 1935

Kendall Refining Co.
Pittsburgh,
Pennsylvania

Gentlemen: I enclose Mr. J. R. Smith's

letter. He says you will be glad to learn that I used Kendall Penzbest Oil in my flight yesterday during which I established a solo endurance record for women.

On this flight as well as many others I have made, including my ultimate flight, I have used your oil with the most satisfactory results. The weather was unusually nice during the flight but the motor functioned perfectly and I feel Kendall Oil helped me immensely.

It does not seem to make any difference if the weather is hot or cold as your oil works up under wide open throttle on a hot day and shows without any difficulty when it is cold.

There is especially a feeling of satisfaction when I know that Kendall Oil is in my motor and it has helped me overcome many times that relation is just as safe for women as it is for men.

Sincerely,

S/Sgt.

Elmer Smith



ELMER SMITH

says Kendall Penzbest helps to make aviation safe for women

Fighting bitter cold and high winds over Long Island for 15 hours, 16 minutes, 49 seconds, Elmer Smith of Freeport, Long Island, established the world's endurance record for women's solo flying when she stepped from her Brewster-Wheeler Red Fox plane after landing at Maclean Field at 10:02 a. m. January 31, 1935.

The pretty girl who also achieved a women's altitude record in August of last year, generously gave credit to the lower production lot in the part played by Kendall Penzbest Oil in helping to make her flight a success. In expressing her opinion of Kendall Penzbest, Miss Smith does so to one who knows as ability thoroughly and who has used it consistently throughout her aviation career as a pilot.

The superior quality of Kendall Grade of Pennsylvania crude from which Kendall Penzbest is exclusively refined, the thorough methods used in its refining, the care with which it flows the moment the engine is started and its effectiveness as high operating temperature, insures the performance in any way in terms of speed and endurance.

Kendall Penzbest Oil is absolutely the choice of winning pilots everywhere. It is helping to make aviation safe for women—safe for all. For a list of airports where Kendall Penzbest is now on hand, address Aviation Division, Kendall Refining Company, Pittsburgh, Pa.



The
Berryloid
Fleet



STINSON and
Berryloid

The excellent Stinson inspired the working on the Stinson Berryloid engine because it worked with the same Stinson Berryloid and Stinson engine.

KENDALL PENZBEST MOTOR OIL



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GRADE OF PENNSYLVANIA CRUDE

TRANS. DIV. for marketing API-151515

"Eddie" Stinson writes—

STINSON AIRCRAFT CORPORATION

DETROIT, MICHIGAN
January 8, 1929

Harry Brothers, Inc.,
111 14th Street,
Detroit, Michigan.

Attention Aviation Division

Gentlemen:

Of the scores of Stinson planes finished during the past three years in Harry's shop, Detroit, Harryfield and I have, very few of them have yet required reworking. Your products and excellent service have given us great satisfaction at all times and we shall continue to use Harry Brothers in our new factory now under construction.

With the additional equipment and space available in our new shop and paint department we anticipate that the new production Stinson planes shall emerge even better finished than those of previous manufacture.

Your close co-operation with us in finishing problems has always been appreciated.

Very truly yours,



EDWARD A. STINSON, President,
STINSON AIRCRAFT CORPORATION.

1022-87

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PROGRESSIVE - AIRCRAFT - FINISHES

BERRY BROTHERS
Varnishes Enamels Lacquers
Detroit Michigan Indianapolis Ind.



"It has stood up well under tremendous abuse"

Michael F. Steffen says of the WACO "10" used by the Elm Aviation Club

ON JUNE 9, 1928, the Elm Aviation Club of Buffalo bought a new OX5 WACO 10. Up to January 5, 1928, "it was flown over 500 hours... was landed over 2,000 times... has solved 9 students. It has stood up well under tremendous abuse... today it's in very good condition." This is the report of Michael F. Steffen, manager of flying operations. He makes a statement typical of WACO users everywhere when he says, "I do not believe that we could have chosen a better airplane for our work."

Again, fact rather than claim proves that superior performance was the common preference for WACO airplanes in student training and for pleasure and commercial flying. In open competition for reliability, unusual strength, speed and all-around usefulness, WACO airplanes placed first in the important air events of 1928. Complete information covering the 1929 WACOS sent on request, without cost or obligation.



The WACO "10" bought and operated by the Elm Aviation Club, Buffalo, N. Y., and 7 other 10 Club Members.

Interesting facts about the Elm Aviation Club

The members disapproved and bought new WACO 10. Early member pays attention for his own time in the way they has been good and all, just not with the general opinion.

All were here there in repairs on plane, and a damaged one.

Plane used for regular and emergency flying, student instruction, recreation from state and all other, spot landings, etc.

Values ground cover, ship or cargo, and, new Elmore have made, one other replacement made in 1928, another had service.

Powered with OX5, Hupson-Jones and Wright "Wichita" motor, type 10000000 15, 15, 25, 41 and 40.



THE ADVANCE AIRCRAFT

COMPANY, - TROY, OHIO



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The AVIATION MARKET

**Where it is,
what it is,
and WHY**



Predictions indicate that there will be more airplanes produced in this country during 1929 than there will be pilots—people qualified to fly them. Thus, aviation presents a perplexing problem, the solution of which is quite obviously ... the training of more pilots.



superior gliding qualities and an inherent stability, it will glide farther and with a greater degree of controllability at lower speeds than any other type of plane in existence today. Equipped with a forty horse-power Baldern engine, an AKL-27 will carry two people one hundred miles on less than four gallons of fuel. Compare this economy of operation with that of planes now used for flying instruction.

If no other qualifications were considered, the selection of an airplane for training purposes, the simplicity of the construction in the AKL-27 would win your approval. For, there are no wires in stock, and all parts are interchangeable. The entire plane can be dismantled and assembled by two men in a few minutes. Skilled assistance is unnecessary, and maintenance is insignificant at an expense. With the wings spread ready for flight or detached for storage, the weight of an AKL-27 is so lightweight that one person can now fly it with ease. As for performance, one demonstration will convince you beyond any possible doubt.



The engineering principles embodied in the AKL-25 enable it to take off and land in the roughest and roughest of fields. Due to an

**Distributors
and dealers who
Understand ...**



For the distributor and the dealer who understand the aviation market situation, there is no opportunity to make 1929 a most lucrative year. Because, the major market of aviation is unquestionably flying instruction ... flying schools ... and, the right place for that particular purpose.



The distribution of the Aeromarine Klemm AKL-27 is nationwide in scope, and, there are all available some very desirable locations. We are interested in opening negotiations with highly responsible individuals and corporations—men who know aviation and have sufficient sub-scribed capital to render a genuine service.



The progress of aviation depends fundamentally, we believe, on the well-known four factors—men, money, methods, and markets. That is why we want men ... distributors and dealers ... who have sufficient money with which to work, who have an appreciation of modern merchandising methods, and, who know the aviation market.

If you can fulfill these qualifications, write us for details. Our franchise is liberal ... our product is profitable ... and, we are prepared to make immediate deliveries.



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1000 H.P.M.

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Dept. of Commerce Cert.
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Eastman Aircraft Co.
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THE WARNER AIRCRAFT CORPORATION
Detroit-Michigan
U. S. A.

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BARGAIN BUT
TRY AND GET A
BARGAIN OUT OF
USING IT

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The Right Price

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making of safe night flying. That is why **SKF**
Ball Bearings are so largely used on aviation
accessories, engines and planes.

On the "Hebco" beacon, the top portion of

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to replenish the lubricant is about all the
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AVIATION

The Official American Aeronautical Magazine

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SIDNEY - NEW YORK

Contractors for the U.S. Army and Navy

The New-Day Plane is Ready!

The Barling NB3 has taken its place in the sky!

This announcement, so eagerly awaited by the aeronautical world, culminates fourteen years of intensive study and exhaustive experiment by Walter H. Barling, internationally known engineer.

Competent aviators pronounce the Barling NB3 years in advance of any other aircraft now marketed. It is truly a New-Day Plane!

The structure of the Barling NB3 is the safest and least subject to failure of any airplane now made. Fundamentally sound dynamic principles, the advanced shell-type box-spar all-metal wing, utter simplicity—these are but a few of the ingenious features engineered into this monoplane.

The Barling NB3 will make its official debut at the Detroit Show. In the meantime, distributor contracts are still available in several sections of the United States.

Watch for announcement of specifications and performance records next month.

NICHOLAS-BEAZLEY AIRPLANE CO., INC.
Manufacturing Division
MARSHALL, MISSOURI



BARLING NB3

Monoplane

STANDARD INDUSTRIAL AVIATION



The Oldest American Aeronautical Magazine

VOL. XXVI

MARCH 2, 1929

No. 9

The Ideal Sport Plane

THE staff of AVIATION has been giving serious consideration to the matter of a sport plane which the aviator could use for cross country trips and business purposes. They have discussed the matter among themselves and with other plane experts; they have flown with anyone who has offered them a ride and have even gone as far as to try for a flight. Each one of the five men on the staff has supplied his ideas and the result is a carefully worked out composite list of specifications for the ideal sport plane. It is thought that ideas might be useful to manufacturers of sport planes in indicating the demands of prospective purchasers. It should have the high speed of a Lockheed Vega, the slow landing speed of an Aero and the quick take off of a Waco J powered with a Whetwind engine. It must have the maneuverability of a Cessna patrol, the inherent stability and the well proved qualities claimed for an Arrow Sport and the long life of a Junker. It should certainly be an airplane and, though normally seating two people, it should have an extension feature which would give it the carrying capacity of a Ford transport. The forward and down stability should be steeper so that in the early types of Cessna pusher planes and, of course, vision to the rear must be unobstructed. The engine should be of low power and, for the sake of simplicity, should not have more than four cylinders—preferably it should be a Diesel.

If these specifications are complied with, the staff of AVIATION feels sure that the plane will meet with a ready market. Lastly, but not least, the plane should not cost more than two thousand dollars.

In Retrospect

THE New York Show was a marked success both from the point of view of the crowds attending and also from the contacts made with an actual buying public. It certainly outstripped both Detroit and Chicago in attendance and many seemed to believe that it had been equally successful in the matter of direct sales to users. Such a success for an unstructured show seems to have been a surprise to many in the industry.

This reflects the fact that it has been the habit with many to emphasize the difficulties of flying in the East, and of playing up the West as the great aircraft market. From the strictly flying point of view the great open spaces of our western and middle western country are ideal, but it must not be forgotten that the enormous population and the great commercial wealth of the eastern states give them many advantages. The proportionate number of people who have the urge to fly is probably fairly equal throughout the country.

It has been pointed out that eastern airports are far

from the cities. This is true but it is also true that they are often in close proximity to the suburban houses of some of the wealthiest people in the world. Much of the East does not make good landing country, but after all, most airplanes land on airports and eastern airports are close together. New York for example has over a dozen in an enormous city, and Philadelphia has nearly half as many. While aviation is fast and frequent but there are many more people traveling than there are on the western prairie. Also the automobile roads in the East are so congested, especially on Sundays and holidays, that the automobile is almost very slow and tedious any of getting about. As in the East not being so isolated this is only partly so. The eastern newspapers have given enormous amounts of space to aeronautical news and the leading papers carry aeronautical sections in their Sunday supplements. The information obtained is reliable and informative and has a great educational effect. The great rise in aeronautical stocks on the New York market has also probably done its bit in getting people needing in the East interested in the business of flying.

In spite of its admitted handicaps the East is a very large and unexploited market for aircraft and the industry should not ignore it in its future show program.

Gliding and Soaring

THE Germans who have gone further than any one in countries, flight makes a very sharp distinction between gliding and soaring. Gliding is soaring down through the air from a higher to a lower point. Soaring is soaring up a rising air current so that the flap rises to a point higher than its starting point. In practice this differentiation is very odd. The machines built for gliding are extremely simple and rugged in their construction, and no attempt is made to make them aerodynamically efficient. Unless they are launched off a cliff or in very violent up winds they do not get very high off the ground, and the flying of these is of a most elemental sort. The soaring machine is extremely delicate in its construction, it can rise to great heights and it is an extremely difficult machine to fly them well, and takes a well trained pilot to fly them at all.

Aeromaps has been slow in realizing the necessity for the distinction between the two types. Gliding, done under proper guidance and with some direction, is a safe, economical and training way to learn how to handle controls. An enthusiastic and energetic group could teach themselves to fly with a glider, and provided that they went at it slowly and started from the level or a very slight slope, they could do it with comparative safety. A soaring machine, which though really only a very efficient glider, is not at all suitable for training. A student would not think of starting his training on a Pulkert racer, nor should he start his gliding instruction flying in a soaring machine.

AVIATION, Now a McGraw-Hill Publication, Enters an Era of Greater Service

THE publisher of AVIATION announces what is perhaps the most significant and far-reaching step in the history of aeronautical journalism. Spurred by the many opportunities and problems facing the aviation industry, and determined that AVIATION shall continue to make the greatest possible contribution to its progress, the AVIATION Publishing Corp. has joined forces with the McGraw-Hill Publishing Co., the largest business publishing organization in the world.

Therefore, with the issue of March 9, AVIATION will appear under McGraw-Hill ownership. It will be edited and managed by the same personnel which has served it so well in the past. But it will be strengthened by the greater resources and facilities afforded by this well known national institution. It will make possible a broader and more helpful service to our readers. It will assure our ability to keep pace with the outstanding development of this great industry and maintain the highest standards of modern industrial journalism.

For this expansion, there is a strong foundation. For thirteen years AVIATION has assiduously strived to serve the members of the aeronautic industry, not only with authoritative articles, complete news and constructive ideas, but through assistance outside of its publishing activities. To do so the publisher and the members of the staff have often had to set aside personal or individual desires for the good of the whole. As a result the magazine has always possessed a tone and quality which could not have been obtained in any other way.

During the last years which followed the World War, when more than a few aeronautic organizations passed out of existence, AVIATION carried on with its work in spite of almost insurmountable difficulties. At that time it was realized that the military and technical phases of flying which had been the chief interest of the paper up to then, should be expanded to embrace

the increasing importance of commercial aviation. And as a consequence the editorial policy of AVIATION was altered to comply with the new needs and demands.

Since that time the world has witnessed a phenomenal growth of an industry that not long before was but a myth in the minds of many. In line with this progress, AVIATION grew and prospered. The fact that during the past year its staff has been doubled, bears witness to this growth. Incidentally five members of this editorial staff are pilots and a sixth is now taking instruction.

This success has been founded on the high principle of unselfish service to the reader and to the industry. And it is but a further expression of this ideal that the paper has now become a McGraw-Hill publication.

The McGraw-Hill Publishing Co. is well known throughout the entire world of business, as publishers of twenty-five engineering, industrial and business magazines. It, too, has won the respect, admiration and friendship of the industries which it serves, and will contribute to the aviation industry a wealth of experience and knowledge from other fields, that are becoming more and more closely allied with aeronautics. In addition the new alliance will bring about a much desired stimulation in the aeronautic publishing field.

Of course, it is not without a certain regret that the publisher of AVIATION has come to recognize the many advantages of a merger with this larger organization. The decision was influenced by our responsibility to the present and future growth of aeronautics. It means that AVIATION will be able to serve the aeronautic industry more completely than ever before.

The old publisher of AVIATION can not take this next step in AVIATION's progress without expressing his sense of personal obligation to his friends in the industry for the hearty cooperation which has made a happy experience of what otherwise would have been a difficult task.

Why McGraw-Hill Desires to Serve the Aviation Industry

IN MAKING this announcement that AVIATION has joined the McGraw-Hill group of industrial, engineering, trade and business publications, I wish to express our gratification that we are entering this field with a paper that is not only the pioneer but the recognized authority on aeronautics. Our interest in the aviation industry is natural. For it has been our aim to develop a group of publications rendering an intimate service at the very heart of American industrial and business life. And air transportation is fast becoming of vital importance to both industry and business.

Several of our papers have long been closely concerned with various aspects of the progress of aviation. *American Machinist and Factory* and *Industrial Management* have been encouraging high efficiency in manufacturing production. *Engineering News-Record* has given much attention to the civil engineering problems of air ports, runways and structures. *Electrical World* has discussed the lighting of airways and air ports, and also signal systems. *Chemical Metallurgical Engineering* has contributed to the solving of many problems of weight, corrosion and wing surfacing. *Rail Transportation* and *Electric Railway Journal* have been recording the development of this new agency of commercial transportation. The *Magazine of Business* recently conducted a year's practical experiment in "Flying for Business," operating its own plane. This broad interest therefore, has a very logical expression in our decision to actively serve the aviation industry itself.

In their entirety, McGraw-Hill publications



JAMES H. MCGRAW
Chairman of the Board
McGraw-Hill Publishing Company

now cover the five major branches of engineering—civil, electrical, mechanical, mining and chemical—and the industries allied with these. They embrace also two divisions of the field of transportation, the electrical and radio trades, the food and textile industries. In addition they serve the interests of production, management and service-to-production in all manufacturing industries; and finally, the broad field of commerce, business and finance.

Aviation is now becoming a vital tool of modern business, and a new basic industry is in process of development. McGraw-Hill

desires to contribute to the progress of aviation a publishing service that will provide every facility of modern industrial journalism to aid in the solution of its inherent problems.

We assume the publishing direction of AVIATION with the conviction that the resources of the McGraw-Hill organization will bring new strength to this paper and practical benefits to the industry beyond the reach of a single publication. We enter this field only because it is clear that there is an opportunity to render a service that will advance the art of flying and its economic development. We are glad to welcome into our organization a group of men of the type responsible for the splendid record and fine prestige that AVIATION now enjoys.

James H. McGraw

Activities of the Aero Chamber of Commerce

By JAMES P. WINSTON

SINCE its formation and incorporation as a non-profit organization under the laws of the State of New York in 1918, the Aeronautical Chamber of Commerce of America, Inc., as it is formally known, has been fostering the advancement of aeronautical aviation through efforts centered in the enlightening of public opinion and in improving trade conditions within the industry itself.

Much of the work in the first years of its existence was rather unproductive in character, for tangible results from promotional work are often hard to secure. Nevertheless, the value of the work was recognized clearly. As a result, the Chamber, as a trade organization representing the combined interests in the aeronautical industry, has achieved the development of the industry as a whole in its growth.

Like all other aeronautical activities, the Chamber of Commerce has made tremendous strides in the last year, and particularly in the last few months. This growth is the result, of course, of the development of the industry. It is also the result of the institution of an extensive program for expansion, which was adopted at the annual meeting of the organization, held July 21, 1938, when changes in the by-laws were effected for the purpose.

Up until that time, the Chamber was a highly centralized body. Its members, whether they were manufacturers of complete airplanes or the makers of accessories, were grouped together. There was no attempt made to segregate them into different divisions, and there could be no attempt made, because there was no machinery for the purpose. The method of organization had served quite well during the first few years, but with the growth of the industry it became entirely inadequate.

The program for expansion called for the demarcation of the Chamber and its organization both geographically and typically, an increase in the number of governors, the election of regional vice-presidents to head each of the geographical divisions, the appointment of a large number of standing committees, and an enlargement of the staff at the New York headquarters. In addition, the various types of membership were revised.

While the program has not yet been carried out in its entirety, much has been accomplished since the plan was put into effect. The provisions for taking in almost any person interested in aeronautics, in one way or another,

and the formation of sections for the various branches of the industry, as well as the establishment of geographical divisions, have had an extremely beneficial effect. Through this system, the governmental agencies have been notified, and the Chamber has been able to render greater service to its members. Besides that, almost any expression can be made, which would not have been possible under the older and more clumsy organization.

Under the new system, there are three membership classifications. These are "organizational," "associate," and "inactive." Associate memberships are for clubs, aviation and aeronautical interests in general, and in the category fall newspapers, chambers of commerce, boards of trade and trade associations, engineering societies, committees or sections. The standing members are individuals, who are interested in commercial aviation as a business, while the organization memberships are granted from having an outstanding interest in aeronautics. The organization memberships are further subdivided into three classifications.

Organization divisions, in class "A," are aircraft and engine manufacturers; air transport operators, affiliated transport operators, such as regional air forwarding lines, flying schools, financial institutions specializing in aeronautical emergencies, insurers and distributors of aeronautical parts, and the producers of aviation fuels and lubricants. Class "B" includes the manufacturers of aircraft and engines, whose products are still in experimental stage, accessory manufacturers, airport and survey designers, builders, managers and operators, publishers of papers and magazines dealing with aeronautical subjects; photographers, surveyors and engineering organizations affording aerial equipment, manufacturers and operators of equipment and devices for advertising in connection with aviation, and aeronautical engineers. In class "C" are jobbers and dealers in aircraft, engines and accessories; flying service operators; aviation schools; air traffic agencies, dispatch, forwarding and others supplying specialized services; and the retail buyers and distributors of specialized aviation products.

At the helm of the Chamber is a board of 21 governors, elected annually. Ninety members of the board are selected by the organization members. Of this number, 50 are of class "A," and are chosen by that group, eight are

chosen by members and are elected by that group, while class "C" selects but one of its own members as a governor. The associate and inactive members choose the remaining two members of the board in a like manner. Vacancies occurring during the year may be filled by a majority vote of the governors at any meeting.

The president, vice-presidents and the general manager of the Chamber, all of whom must be members of the board of governors, are elected by the board at its annual meeting, when a secretary and a treasurer are also elected. The by-laws also provide that an assistant general manager, an assistant secretary and an assistant treasurer may be appointed, or elected, and, if desired, that an honorary chairman of the board, who is not a governor, may be elected.

Under the board of governors is an executive committee. The president and general manager, by virtue of their offices, respectively become members of this committee. To complete the set, which is perhaps the most powerful in the entire organization, the board of governors elects three members. The executive committee is aided by a smaller group, known as the consultant on policy and operations, which it appoints, but this body merely makes recommendations and acts in an advisory capacity. It has no actual authority. The executive committee in reality is an absolute control, as may be seen from the by-laws.

That portion of them, dealing with the function and authority of the committee, is as follows:

"The committee shall elect its own chairman and make such rules regarding sessions and meetings and other matters of organization as it deems necessary. It shall advise and give authority to the general manager in the administration of his office. It shall draft rules governing the regular or special sessions or facilities that the organization may render to its members. It shall have the authority to pass upon questions of record of management, including the hiring of employees, fixing of salaries, setting of offices and determining and providing for the current expenses of the office.

"The executive committee shall have authority to negotiate the arbitration of disputes of any nature arising between units in the Chamber at branch units or the entire membership and likewise outside the Chamber, or outside the industry. The executive committee may act either on its own initiative or on request from one of the departments. The executive committee is consultation with the departments shall provide for the selection of arbitrators and the

establishment of arbitrator rules to govern arbitration."

Below the executive committee, the president and the consultant on policy and operations are the executive members. The president and general manager and the consultant vice-presidents. The vice-presidents all have equal rank, although their duties and powers are conferred upon them by the board of governors. Directly under the executive president and general manager is the paid staff of employees. The regional vice-presidents, of course, are at the head of their respective geographical divisions.

Six geographical divisions were provided for in the original plan for expansion. These are the northeastern division, covering up New York; the south central, embracing upon Detroit, Great Lakes, covering upon Chicago; south central, embracing upon Wichita, southwestern, embracing upon Los Angeles, and the southwestern division, embracing upon Seattle. The purpose of these divisions is to facilitate the internal functioning of the Chamber by establishing smaller units and to provide local organizations that are capable of coping with the individual problems encountered in the various sections of the country. It is planned that the members attached to these divisions will hold conferences annually to transact the regional business. These conferences will provide the national meetings of the Chamber, which it is believed will be held this year, and in the years to follow, after the close of the Chamber's annual show.

The south central division was the first to be organized. This was accomplished at a meeting held July 21, 1938, when 16 aeronautical interests responded to the regional vice-president's call. Recognition of the north central division led to the formation of a divisional committee with the result that there are now 32 Chamber members in the section of the country. This is an increase of 150 per cent, although the division has not been formally organized and probably will not be formed before the latter part of March. Plans are underway also for the formation of the southeastern and southwestern divisions in the near future. Only six divisions were contemplated by the board of governors at the time the divisional plan was outlined, but at the request of the southeastern interests in the Midwest, a seventh division, the southeastern division with headquarters in Miami, was established by the board at its last meeting.

Aide from the regional divisions, the Chamber of Commerce is now organized into 13 topical sections. Each section is composed of the members engaged in the same



F. B. Reuthe, head of Post & Whitney Aircraft Co., vice president of the Aero Chamber of Commerce

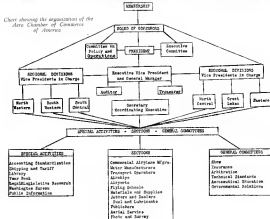


Left to right: Owen A. Shannon, treasurer, S. S. Bradley, vice-president and general manager, and Luther K. Bell, secretary of the Aeronautical Chamber of Commerce of America, Inc.

phase of commercial aviation, and, of course, such is reflected particularly in its own branch of the industry. Only some of the groups are operating actively thus far. These are the commercial airplane manufacturers' section, which began work in August, 1928; the engine manufacturers' group, the flying school, the airport and the fuel and lubricants sections, which were organized at the International Aeronautical Exposition in Chicago; the transport operators group, which came into being during the recent radio conference in Washington, and the airway division, organized while the International Civil Aviation Conference was in progress. The section devoted to material, equipment and supplies, which will include the manufacturers of airport equipment, the pilots and dealers, publishers, aerial service, and the photography and survey groups have not yet become active.

To deal with the ever increasing number of problems of the industry, the program for expansion called for the establishment of a number of new standing committees. The show committee and the aeronautical education committee have been in existence for some time, and to these were added committees on aeronautics, arbitration, industrial standards and governmental relations. The members of these new committees have not yet been appointed, but it is believed they will be named in short time. In addition to the general committees, the number of special activities of the Chamber was greatly increased. These include accounting, standardization, shipping and tariff, the library, the year book, legal and legislative research, the Washington Bureau and public information.

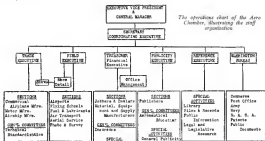
Chart showing the organization of the Aéro Chamber of Commerce of America



For the members of the Chamber, themselves, to have reviewed the business of the organization and the increased number of activities in their industry would have been a tremendous amount of labor. With this in view, the board of directors authorized the vice-president and general manager to establish an executive staff, consisting of a corresponding executive and an assistant executive, each of whom would be assigned specific duties, so that the responsibility of the work might be definitely fixed. In accordance with the plan, the secretary became the corresponding executive and under him were established the offices of public relations, field executive, financial executive, who is the treasurer, publicity director, reference executive, and the director of the Washington Bureau.

The field executive deals with the overall shows of the Chamber, the commercial airplane manufacturers, the engine manufacturers and the airport manufacturers sections in the typical organization, and also handles the work of the general committee on technical standardization. The field executive is in charge of the show detail, and takes care of the work of the airport, flying school, fuel and lubricants, or transport, aerial service, and photography and survey sections. The management of the affairs of the Chamber comes under the jurisdiction of the treasurer, who deals also with the jobber and dealers' section; the material equipment and supply manufacturers' group; the general committee on arbitration; and the special sections of accounting, standardization and shipping and tariff.

The publicity director has been assigned the publishers'



The operations chart of the Aéro Chamber, illustrating the staff organization

section, the general committee on aeronautical education, and three special activities. These are: public relations, show and general publicity and the year book detail. The reference committee has charge of the library, the files and records, public information, and legal and legislative research. Commerce, the Post Office, the Army and Navy, the National Advisory Committee for Aeronautics patents and public documents are listed as being the activities of the Washington Bureau head.

Perhaps the greatest amount of work has been accomplished by the commercial airplane manufacturers' section since the institution of the new scheme of things. It operated as a special committee long before its establishment as a section, and it naturally had a better knowledge on which to build than some of the newer groups. There are now 44 airplane manufacturers in the Chamber, and all of them are active in the departmental work. The industry interest which they are displaying, is shown by the fact that the group has held four subcommittee meetings in local organization as a section. Two of these were in White, one in Los Angeles and one in Chicago.

A number of concrete results have been obtained by the airplane manufacturers as a result of these conferences. Among these is the adoption of a standard form of sales agreement between the manufacturer and the distributor. This form, with slight modifications to meet the needs of the individual manufacturers, is now being used by the various members. In addition, standardized sales agreements for the use of the distributor and the dealer, and a standardized agreement for the use of the dealer and the airplane purchaser are also being developed. The manufacturers also are now co-operating with the national association of finance companies in an effort to evolve a system for financing aircraft, which will aid in the development of airplane sales as a new line. It is understood that the former board of directors is now working on the grounds that, as soon as plans, until the final payments are made, they are liable for damages.

Another of the outstanding accomplishments is the formation of a standardized plan for the performance testing of commercial planes. This plan, which has been under discussion for more than a year, was evolved by a

committee consisting of representatives of the airplane manufacturers' section, the members of the staff of several universities and colleges maintaining aeronautical engineering schools and the Department of Commerce. In a similar fashion, it was approved by the manufacturers at the meeting held in Chicago with the International Aeronautical Exposition was in progress. At that time, Prof. Alexander Klemin, head of the Guggenheim School of Aeronautics at New York University, was appointed the chairman of the test plan committee and was asked to work toward the improvement of the tentative suggestions made. Announcement that the plan is ready to be placed in operation was made recently, and it is said that the manufacturers who have been co-operating with the Chamber will soon be able to conduct the first tests under it.

At present, the system evolved is restricted to the performance characteristics obtainable by cast aluminum. For this reason, it is regarded only as the first step in the making of a common basis upon which all performance data for commercial aircraft may be obtained, although the results of the tests made in accordance with it will be placed on file in the office of the Chamber and will be available to all. In its actual application, it is believed that improvements will be made. However, one of the most important benefits which is expected to result, is the lowering of the airplane industry's operating expenses, thereby making for the performance of commercial aircraft in advertising.

Among the other accomplishments of the manufacturing section may be listed the action taken toward the end of obtaining uniform discounts from manufacturers of aircraft engines and accessories. A resolution requesting the establishment of uniform discounts was moved by the airplane manufacturers, and as a result, a committee of the engine builders' section is now investigating the discount system employed in the automotive field as a possible precedent for discounts as far as aircraft engines are concerned. The co-operation of these two units of the Chamber in this regard has been cited as an example of the practical machinery provided for the organization for settling disputes which might easily be-

cause serious friction among branches of the industry. Technical standardization also is a problem with which the airplane manufacturers have been coping. Reducing the expense of standardizing the methods of design and engineering, as well as the forms of construction, a committee has been appointed to act as a liaison group between the section and the Society of Automotive Engineers. Economy in the purchase of materials and supplies likewise has been a subject item which the group has solved. In this connection, the manufacturers arranged a meeting of their purchasing agents as a means of promoting the exchange of ideas and for the purpose of establishing personal contacts between the purchasing departments of the various plants. This meeting was held at Wichita in January. The staff of the Chamber, acting in the movement, is now compiling a directory of the various sources of supply for use of the purchasing agents.

The tremendous increase in the number of questionnaires sent out, principally by those in other lines of business seeking a profitable entry into the aeronautical field, led the manufacturers to put a resolution during the staff of the Chamber to handle these matters as a means of relieving the burden thrust upon the individual members. As a result, the Chamber executives are attempting now to keep statistics regarding all the demands of the industry.

In addition to the very definite accomplishments at the commercial airplane manufacturers' section were its formal operations, the group has created a number of activities, which are being carried out in complete secrecy. Among these is an investigation of shipping and tariff. Again, the staff of the Chamber, at the direction of the manufacturers, is attempting to make an analysis of the subject, which it is hoped will bring about better economies. Confessions are being arranged with exporters, importers and freight officials to discuss the subjects of packing, shipping and crating and rates.

A survey of the accounting methods used by the plane manufacturers is also being made in an effort to establish a uniform system, such as that employed by the automobile manufacturers. Later, it is believed, similar surveys will be arranged for airplane distributors and airlines. The Treasury Department of the Federal Government has been interested in this, since it will cause a simplification of its work in compiling tax returns. Another special activity, for which the manufacturers are responsible, is the plan for the organization of a legal and legis-

lative department to be instituted by the Chamber as a part time basis at first.

The air transport operators' section, in spite of its recent organization, has become one of the most active groups in the Chamber. In fact, the Chamber is planning to open an office in Chicago in the near future at the instance of this section, which now has 15 members, including the operators of the major trunk lines of the country. Traffic, rates, utilization of service and the radio question are a few of the problems with which the operators have been working.

The radio problem is probably of the greatest importance, and perhaps the most was accomplished toward its solution following the formation of the section at the Washington conference of the airline operators, the representatives of the Federal Radio Commission, the Department of Commerce and the War and Navy Departments. This resulted in a definite agreement of cooperation on radio communication by the trunk airlines of the country; the adoption of specifications for the guidance of equipment manufacturers; and the communication to the Federal Radio Commission for the allocation of special bands for the use of the lines.

The engine manufacturers' group, which now has 12 members, has on test is beginning to function as a section of the Chamber. At the organization meeting in Chicago, the engine builders appointed a subcommittee to survey the current situation as a means of co-operating with the airplane makers. At the same time, it decided to enter negotiations with the department of Commerce in an effort to secure changes in the method of issuing approved type certificates. It is understood that the manufacturers feel the present system is too slow and holds up production for too long a period. They are endeavoring to make arrangements so that the Department of Commerce tests may be conducted at their own plants under the supervision of Department of Commerce men.

The fuel and lubricants section, next to formation, has taken a definite stand against the burning of free gasoline and oil for use on engine-driven lights and other record-breaking stunts, simply for the purpose of obtaining publicity. The practice has reached a point, it is said, where any act of irresponsible engine or oil companies, and the members of the Chamber group are attempting to eliminate it. The action has also requested that the engine manufacturers furnish data concerning any problems they are encountering with fuels and lubricating oils, so



Left to right: Charles F. Cowan, vice-president of the south central division; Frank H. Russell, head of the aircraft engine manufacturers; and P. G. Johnson, vice-president in charge of the mathematics division.

that it may co-operate in an effort to solve those problems. A sub-committee on aircraft fuels also has been appointed as a liaison group to work with the Society of Automotive Engineers, the Aeronautical Society and Testing Materials and the departments of the federal government.

The airline section of the Chamber has only three members, but it must be remembered that the same is valid in the instance of the branch of the industry are tremendous. The airline group has appointed a committee to advise the Chamber in its conduct in matters concerning the operation and manufacture of lighter-than-aircraft.

Membership in the airport section is now limited to airport managers, although the group hopes to co-operate directly with the airlines including the airport construction and the manufacturers of airport equipment. The work of the airport managers so far has been the study of improvements in the standards of service and airport equipment. It is expected, that as a result, a standardization of rates and services will be effected, and that a uniform tariff agreement will be concluded. A sub-committee of the section also is working with the National Board of Fire Underwriters in the preparation of a suggested code for the collection of fire hazards at airports.

The flying school section of the Chamber, like the airplane manufacturers' group, was formerly a committee. The principal work of this section since its organization has been the formulation of a set of air requirements for accredited flying schools. These requirements have been approved by the Aeronautics Branch, Department of Commerce and the action is now working in preliminary with the government for the establishment of an A, B, C, rating system for all schools that apply for recognition. It is believed that the adoption of such a system generally will eliminate any schools of questionable standing and will further strengthen the industry. In this work, the flying school group has related the aid of the Better Business Bureau throughout the country in the prevention of misrepresentation in advertising.

As a result of the forward work, which has been thrust on the staff of the Chamber by the program for expansion, it has been found necessary to expand the office force besides adding to the number of executives. The volume of work accomplished in the last year and the changes that have been made are cited in the annual report for 1938, which has just been made public.

Since the new organization was advised, the Chamber has formed a very definite policy in regard to national shows. It plans to hold one national show each year, at which the International Aeronautical Exposition in Chicago was the first. For the purpose of handling the finances, the Aeronautical Exposition Corp. was organized by the members. The Chamber, of course, is a non-profit organization under the articles of incorporation. However, the money obtained by the exposition reverts back for use in industry promotional work.

Besides one national show, which in reality is staged by the industry through its own organization, the Chamber will sponsor two other types of expositions, although the membership has gone on record in definitely opposing airshows arranged by professional promoters. These two types are known as class "B," or regional shows in which the Chamber will participate in the management and will receive a portion of the profits; and class "C" shows, which are purely local undertakings and are sponsored by the doctors and distributed on a non-profit making basis, as a means of promoting local aircraft sales. The Chamber's national expositions is the only one given as an "A" rating this far.

In line with the policy adopted by the Chamber, the show committee has authorized two class "B" and two class "C" shows this year. The class "B" expositions are the Detroit show, which will be held in April, and a Kansas City show to be held in the summer months. In class "C" the Buffalo show, which will be held in March, and an exhibit in Wichita to be held some time during the summer are the two that have been accepted.

As a result of the increased number of activities and its decentralization, the Chamber now has a much wider appeal than heretofore. This is shown clearly in the tremendous increase in membership during 1938. A year ago the membership totaled only 244. It has now reached 430.

On the organization membership roster there are 33 class "A" members, as compared with 26 at this time last year; and there are 144 members in class "B," as compared with 79 a year ago. The class "C" organization members and the associate and sustaining members have also jumped in number from 129 to 261. With the increased funds available, a method of organization that will permit infinite expansion and the constantly growing number of members, the Aeronautical Chamber of Commerce should assume an ever increasing position of importance in the industry.



Left to right: J. Don Alexander, head of the airplane manufacturers' section; Harold P. Peterson, vice-president in charge of the eastern division; and Paul Hendricks, Great Lakes regional vice-president.

The Todd Monoplane

Lights Externally Braced Monoplane Specially Designed for Use as An Express Carrier in High Altitude Operation

By H. A. LINDERBERG

A MONOPLANE, for use in high altitudes, although it can, of course, be of service elsewhere with a corresponding change in the performance figures, has been designed and built by E. H. Todd of Douglas, Wyo. The first model was produced with an OX-5 engine, but the necessity of this power plant made it advisable to provide a detachable engine mount integral with the fuselage so any of the various motors in present use up to and including about a 100 hp. engine can be installed as desired to meet the requirements for which the particular plane is intended.

The Todd monoplane has been designed to be used as a light express carrier, but can be quickly adapted to special instruction and passenger carrying by replacing the removable front seat in the baggage compartment. There are many parts of the country where greater wing surface area is advantageous because of the high altitudes, so this plane was primarily designed for such regions that necessitate long runs for take-offs and fast landings when the customary short wing planes are used.

The wing, which is in three sections, consists of two outer panels of 15 ft. length each and a 30-ft. center section, where two gasoline tanks of 20 gal. capacity each are located. Reinforced "T" section spars with splice ribs are used in the construction of the wing, of Clark Y curve, which is covered with fabric. The center section is fastened to

the fuselage by struts of streamlined tubing placed at such an angle that good visibility is possible for the pilot. The outer panels are joined to the center section by large rigid fittings and are supported by 30 ft. struts that are attached to the lower corners on each side of the fuselage. The lift struts are of Clark Y section to a point midway from their lower tips, the upper halves being split into two streamlined struts that are connected with flexible fittings to the outer panels. At the point where the lift struts, on each side of the fuselage, branch out into two streamlined struts they are 18 in. in width, with the width of the separation of the struts at the outer side of the wing being 4 ft.

In order to decrease the vibration of the lift struts as well as to increase the structural strength of the plane, two streamlined fittings connect the wing and the main struts on either side of the fuselage. The struts are controlled by bell cranks with the wires running through the front lift seats to the fuselage, where connection is then made with the stick. The struts extend in 7 ft. from the outer tip of the wing on each side and are 14 in. in width, of angle steel to easily control the plane in flight.

The fuselage, of welded steel tubing, such as is the engine mount, is well streamlined and the frontal area is reduced to the point where the parasite resistance is mini-



Side profile view of the Todd monoplane, which has been designed as a light express carrier for high altitude work.

mized and yet the desired space is available in the front compartment as well as in the pilot's cockpit. Fabric is used in the covering of the fuselage up to the nose section, which is covered with aluminum, the cylinder ends and the outer areas being exposed so as to make these parts readily accessible as well as aid in the cooling of the engine. A Warren type truss is used in the construction of the fuselage in the distance containing pilot's seat and from there forward the Pratt type is used. A door in one side of the covering provides ready access to the carburetor and the motor pump. The U. S. Certificate of Registration is mounted on the side of the lower baggage area tubes, which extend forward from the engine supports thus preventing it from obstructing the pilot's vision to a rear when the machine is placed anywhere between the upper wing and the top of the fuselage.

The empennage is built up of welded steel tubing covered with fabric; the horizontal stabilizer being adjustable, but the vertical fin can be changed while the plane is on the ground. Short streamlined struts for bracing run from the upper and lower surfaces of the stabilizer to the fin and the lower part of the fuselage respectively. The customary stick and pedal control is used. The tail sled, a built up of steel spring leaves fastened to the post, with shock cords being used to lessen the strain on the plane when landing.

The pilot's cockpit is equipped with the instruments required according to the Department of Commerce regulations. Both of the gas tanks feed through a single carburetor, which is in full view of the pilot. The gas gauges, which are located on the outer side of the gas tanks, are also visible from the rear cockpit. If the plane is to be used for student instruction, then the dual controls can be easily installed in the plane.

The landing gear, although the original plane was not so equipped, will be of the split type so much in use at the present time as the simplicity of the plane. Streamlined tubing is used in the construction of the undercarriage with 30 in. x 4 in. wheels, having a 3 ft. tread. As a car-

riage on most of the lighter type planes, a shock cord arrangement helps to relieve the strain on the plane when landing.

The Todd Monoplane was test flown in the high altitudes of Wyoming and will undoubtedly be continued to be produced at Douglas, unless some offers for a change of site now under consideration should prove more advantageous. However the plane will be built in high altitude regions as it is desired to test the monoplane under conditions equal to, if not greater in severity to that which it would be used in actual service by the purchaser.

The following general characteristics and performance figures were submitted by the manufacturer:

table border="0">
Wing span	40 ft.
Center section	30 ft.
Outer panels	15 ft. each
Chord	5 ft.
Wing area, including struts	200 sq. ft.
Span of alarons	14 ft. x 7 ft.
Length overall	22 ft. 4 in.
Height overall	7 ft. 5 in.
Weight, fully loaded	1,500 lb.
Weight empty	1,370 lb.
Pow. load	300 lb.
Wing loading, full load	75 lb. per sq. ft.
Power loading, full load (OX-5)	16 2/3 lb. per sq. ft.
Wing section	Clark Y
Angle of incidence	3 deg.
Dihedral angle	3 deg.
Gustiness	40 mph.
Wheel travel	5 ft.

Performance

table border="0">
Maximum speed	120 mph.
Cruising speed	110 mph.
Landing speed	55 mph.
Service ceiling	12,000 ft.
Altitude ceiling	14,000 ft.
Rate for take-off	150 ft.


Watercooled Aircraft Engines

By JAMES M. BERGMAN
Aircraft Commander, U. S. N.



Each of the above flights over a different part of the field of specified purpose design. A discussion of the features of each is in order.

(a) The British entries for the Schneider Cup Race at Venice in 1927 included three types of engines: geared and direct-drive watercooled Napier "Lions," and an air-cooled Bristol "Mercury" engine. All of these engines developed about the same horsepower but the powerplant weight of the Short "Crusader" plane in which the "Mercury" engine was installed was several hundred pounds less than that of the watercooled motors. This great saving in weight prevented the use of smaller wings and of generally lighter structure throughout. Despite the weight handicap, the watercooled motors were fifty miles an hour faster than the aircooled motor.

The reason for this is quite obvious. The watercooled engines were completely cooled, and their wing surfaces followed the contour of the wing surface exactly. The drag of the airframe with radiator and engine installed was little greater than would have been the drag of the engine without powerplant and with the fuselage well tailed. The aircooled engine, on the other hand, required no radiator, but could not be completely enclosed with cooling due to the necessity for exhaust and vent of the cooling air.

(b) The world-circling flights of Gosses and LaRue demonstrated the dependability of an efficient watercooled powerplant in extremes of weather. The Breguet airplane used on these flights was powered with a 600 hp Hispano-Suiza liquid-cooled engine. The engine was completely cooled,

Gloster-Kaplan IV-A over England's 1927 Schneider Trophy contest.

and the underlying radiator was retractable. The smoothness of the 12 cylinder engine insured a maximum of vibration, the retractable radiator insured the maintenance of optimum engine operating temperatures under all conditions, and the total surface area of the engine with cooling eliminated the possibility of engine trouble due to heat or dampness. As in the British Schneider Cup winner, the cooling was beautifully fitted around the engine, giving a minimum faulding drag and excellent forward view for the pilot.

(c) The Savoia-Marchetti plane S-64, in which Del Prete and Ferraris established a world's duration and distance record and then made the longest non-stop flight in history, was the last word in specialized design. It consisted of a huge wing housing piston and fuel, with a mechanism of landing gear, an outrigger tail and an engine neatly mounted above the trailing edge of the wing. The engine was a 12 cylinder watercooled Fiat driving a pusher propeller.

The use of a watercooled engine in this plane had the advantages previously set forth in discussing the Schneider Cup races and the Breguet of Gosses and LaRue. In addition, the powerplant installation in this Savoia-Marchetti was one in which a high powered aircooled engine would have been operating under the worst possible conditions. When driving a tractor propeller, the propeller upstream always causes a blast of cooling air of sufficient velocity, no matter what the speed of the airplane. With a pusher propeller installation as in the S-64, the velocity of the cooling air is much more dependent on the speed of advance of the airplane. Hence an aircooled engine driving a tractor propeller is liable to overheat under some conditions of operation. This is of particular importance, since the investigation of various combinations of airplane wings and powerplants has led to the conclusion that one of the most efficient is an airplane wing with the propeller located above and slightly behind the trailing edge of the wing. This combination was used in the S-64, and may be employed with increasing frequency in the future.

One other aircraft powerplant installation in which



Top: The Savoia-Marchetti S-64 powered with a 12 cylinder Fiat engine and flown non-stop from Italy to Brazil by Del Prete and Ferraris. Bottom: The Supermarine Napier S-5 with which Flight Lieut. S. N. Webster won the 1927 Schneider Trophy Contest.

the watercooled engine is superior is the one in which the engine is totally enclosed in the aircraft structure. This condition is found in the two new eight cylinder engines recently constructed for by the Navy, where the engines will be located inside the fuselage and the propellers will be supported on outriggers and will be driven through long shafts. The same condition arises in designs of large multi-engine planes calling for the engines to be located inside of the wing. In this case, it might be possible to use aircooled engines by providing a tunnel for cooling air, but only at a considerable sacrifice of aerodynamic efficiency.

A recapitulation of the relative advantages of the two types of engines leads to the following conclusions:

(a) That the aircooled engine powerplant is generally superior in regards weight per horsepower, dependability, durability, cost and ease of maintenance.

(b) That the aircooled engine operating at reasonable engine temperatures should be the equal of the watercooled engine as regards fuel economy.

(c) That the watercooled engine powerplant is potentially superior as regards effective thrust per horsepower.

(d) That there are special cases calling for powerplant installations in which an aircooled engine should not be used.



The "Flying Dutchman"

*Single Place, Low Wing Monoplane Powered With 40 Hp. SR-3 Engine
Now Being Produced by Sackety Aircraft Corp.*

TO meet the demand for a light, economical plane to be used by students in acquiring the experience necessary to obtain a license, and the further demand for a sport plane within the purchase range of the average man, the Sackety Aircraft Corp., Holland, Mich., has designed the "Flying Dutchman" monoplane. This craft is now in a production schedule of four planes a week and this is soon to be increased. The plane has a high lift wing and is powered with the three-cylinder Sackety "Big Beaver" engine, which develops 40 hp. at 2400 r.p.m.

The Flying Dutchman is a low-wing, open cockpit type, seating one person. With the SR-3 engine, the plane has a high speed of 80 mph and a cruising speed of 70 mph. It lands at 20 mph and the landing run is less than 300 ft. The take-off distance is approximately 300 ft. The service ceiling is 12,000 ft. and the rate of climb 200 ft. per min. At cruising speed the plane will fly five hours.

The plane has a welded steel fuselage and wood and wire wing structure, in which, however, the compression members are welded steel tube Warren trusses. The spars are of the box type, with spruce capstrips and mahogany sparweb blades. The capstrips are tapered and are spaced on spruce spars—blades. The webs are of twenty webs to which the spars of each ply is attached at an angle of 90 deg. from that in the other. The wing is a true cantilever, a type of construction made possible by the thick wing section employed.

Fittings are attached directly over the sparweb-blades, which insure a solid fitting for absorption of stress. They are all cut from mild rolled mild steel plate and are "weld-fitted," that is, they extend completely around the spar. Each fitting is held in place by a group of chrome-nickel steel bolts extending entirely through the spar.

The former ribs are all spaced, built up in the form

of Warren trusses and each each portion painted with plywood. The trussing is unusually close. Although it weighs but two ounces, the rib will support 350 lb. The ribs are spaced 93/4 in. apart throughout the span.

Compression members are light in weight. The drag-bracing is square section for ribs, used in preference to steel cables or wires because they will not grow slack at all other types of loading with which stresses must be met. Square section rods are used because any twist that might develop in adjusting the bracing is easily seen and can be corrected before the wing leaves the factory. The tie-rods are installed against vibration.

Engine Design for Flying Top Planes

The wing-tips are powered welded steel tube forming the design of which is exclusive to the Flying Dutchman plane. The shape is such as to provide the wing with an effective dihedral which gives a high degree of lateral stability in flight. The steel construction prevents damage should the wing come in contact with a larger fuselage or another plane. As the wing-tip structure is welded in a jig, each wing-tip is of exactly the same lines and can be kept in the positive design desired.

The struts have welded steel tube struts and are braced to butt truss aluminum alloy brackets which are carried on the rear spar. The hinge brackets are very light, yet will sustain more than five times the maximum possible load on the struts.

The attachment of fuselage to wing is also very strong. This linkage is effected by means of fittings which completely enclose the wing spars and the factor of safety of the coupling is in excess of 35. The fuselage is a built-up structure of welded steel tubing, the frame being a Warren truss. There are no welded joints in tension all being in compression or in shear. Mild carbon steel is used because of its adaptability in welding and the fact

that it is less susceptible to deterioration and fatigue than some other steels often used. Hot code pipe is used on the exhaust fuel-line structure.

The engine mount is welded from steel tubing and cold-rolled steel plate. It is stronger, better and heavier than the average domestic make engine. The attachment to the



A front quarter view of the "Flying Dutchman," manufactured by the Sackety Aircraft Corp.

engine is four cold-rolled bolts in double shear. This with the engine is so designed as to be replaced with ease.

Landing gear is of the light-type type, permitting the shock-absorbing unit well up out of the way of observation. The axle is of chrome-nickel steel, mild spring, light but very strong. The shocks of landing and take-off are taken by rubber rings, which permit an equal reaction to be maintained on both sides, which is difficult if not impossible when steel is used. The wheels, 24 by 3 in. in size, are constructed especially for this plane. Their spoke area is covered with rubber, dotted and painted to match the rest of the plane. The tailfin is a leaf spring, fixed with a steel shoe, a type chosen for its simplicity and resistance to wear.

Exceptionally Close Design

The whole plane has very close lines. Two stream-lined shapes are provided forward and aft of the cockpit, to deflect the air currents around the pilot's head. The other one is added in a forward and inside brace are braced with steel tubing, welded firmly into the main fuselage members. These will take up shock and protect the pilot from injury in event of the plane's meeting over. Hence, the body is in the line of the nose and a good balance, it is almost impossible to cause this plane to nose over.

The cockpit is padded all around and is lined inside with weatherproof upholstery fabric. There is a small curved compartment behind it. The pilot's seat is a contoured chair-like, very comfortable and mounted at an easy angle with the cockpit floor. The windshield is heavy transparent celluloid.

The control stick has a rubber grip and the throttle has a large ball-shaped handle, very convenient and easy to grasp to catch on the pilot's clothing as he enters or leaves the cockpit. The instruments are those designated by the Department of Commerce and the accessories include a five centrifugal and firm oil kit.

The forward separating engine and cockpit is of wood and all piping and controls passing through it are protected to insure a tight joint. The main fuel tank is a service glass container, supported in padded steel mountings in the upper part of the fuselage. Its capacity is 10 gal. The oil tank is also of trim plate. Its capacity is 2 1/2 gal. This is placed in the lower part of the fuselage, in front of the fire wall, connected to the oil pump. All welds are of the best low temp type which will resist the risk of fracture from vibration to a minimum.

Like the aluminum, rubber, elevator and fin are of welded steel tubing covered with fabric. They are welded to

pins to ensure uniformity and proper symmetry. Aluminum and elevator are actuated by steel cables connected to the conventional control cables. The stream cables, however, run only as far as a half-inch in the wing opposite the center of the elevator, a push pull rod of steel tubing actuates the stream cable. The control is through cables attached to aluminum alloy cast pulleys. The control horns are all of stream line shape.

Controls are extremely easy of operation, a point which was emphasized in constructing the plane because of its application to the needs of flying clubs, inexperienced pilots and sport fliers. Forward and through inspection is one of the requirements of safety in airplane operation and in the Flying Dutchman everything possible has been done to make this work easy. Only two small panels, one in each end of the wing, need be opened to reveal complex inspection of the stream controls while by opening two others, all other controls are made visible throughout their length.

All wiring is of short aluminum. The engine cooling is so arranged that it can be dropped readily for inspection or adjustment of the carburetor and replaced within a few minutes. This cooling is held in place by positive action wing clamps which cannot become loosened.

The fabric employed is the grade specified by the government for military aircraft and is not to shape and moved before being placed on the plane. It is authorized



D. E. Sackety, president of Sackety Aircraft Corp., standing beside one of the monoplanes manufactured by his company.

by hand stitching to tape wrapped on the longitudinal and transverse. The completed plane is given five coats of high grade aircraft finish, hand dressed with pumice and marbled.

Specifications and performance of the plane follow:
Span 26 ft.
Chord 4 ft. 8 in.
Length 16 ft.
Height 6 ft.
Wing area including internal 168 sq. ft.
Aluminum area 144 sq. ft.
Rudder and fin area 20 sq. ft.
Elevator and stabilizer area 70 sq. ft.
Wing curve 10%
Wing loading 17.3 lb. per sq. ft.
Power loading 99.4 lb. per hp.
Aspect ratio 6.5
Weight empty 540 lb.
Disposable load 215 lb.
Total weight 755 lb.
High speed 80 mph.
Cruising speed 70 mph.
Landing speed 20 mph.
Stall speed 15 mph.
Take-off speed 500 ft. per min.
Service ceiling 12,000 ft.
Take-off distance 300 ft.
Fuel consumption 2 1/2 gal. per hr.



A side view of the Sackety low wing monoplane, the "Flying Dutchman."

Crouse-Hinds Floodlight

ONE OF the most recent additions to the products of the Crouse-Hinds Company, Syracuse, N. Y., is the AEPN Airport Floodlight which was exhibited for the first time at the New York Aviation Show. This flood-



The Crouse-Hinds Type AEPN Floodlight

light throws a powerful beam having a 180 deg. divergency in the horizontal plane and a very limited divergency in the vertical plane, thus providing maximum illumination of the area to be lighted with minimum glare. The light source is a 3,000 watt lamp.

The new Crouse-Hinds light uses a spherical glass reflector, shaped somewhat like a barrel, with one side silvered, forming the reflector, and the other half clear, forming the lens. In addition to giving the ideal light distribution for lighting airports, it is more efficient and gives more light for the wattage consumed than do the old type floodlights.

The housing of this floodlight is largely of cast aluminum alloy, which resists corrosion, and is designed for ease in re-aligning. The lamp receptacle is automatically disassembled from the crown before it is possible to remove

the lamp or insert a new lamp. This insures the operator against inserting a shock when replacing the floodlight.

This new Crouse-Hinds floodlight may be focused perfectly in the daytime by means of a simple optical target with which the lamp filament is aligned. A three-way mechanism further simplifies the focusing operation. A system of levers is provided to cut off all upward rays of light which might be blinding to the pilot.

Aeroboard

AMONG PRODUCTS available for aircraft construction is "Aeroboard," a rubber lumber being produced by the U. S. Goodrich Co. The material, which comes in a variety of forms, consists essentially of two sheets of ultra-hard rubber with a central filling of rubber hard sponge rubber. Fabric is introduced for added strength. The material also can be made with one surface of fabric or metal. In the latter form, the metal is held in the rubber by the "Vulcanite" process which virtually welds the two materials together.

Aeroboard as far has been used in aircraft work to great extent. It has become popular for speedboat construction because of its lightness combined with great strength, its waterproof qualities, and also for its ease of handling.

"Aeroclean" Polish

A NEW product, Berrfield Aeroclean Polish, has been announced by Bery Brothers, Inc., Detroit, Mich., manufacturer of varnishes, enamels and lacquers.

This new aeroclean polish is easy to get on and slide smoothly over to a lustrous or satin finish. Bery Brothers officials state that this polish is absolutely safe, will not penetrate the dope, and actually strengthens it.

SIDE SLIPS

By ROBERT R. OSBORN.

Mr. J. M. W. points out a lot of what may be very honest advertising in some literature he picked up at the New York Show. His letter says: "As you will notice the advertisement states that 'the wings of the plane can be folded by one person in a few moments.' This seems to be an unusual story to feature in high-pressure sales work, in it has been my experience that almost any type of plane can be completely folded by any person in about 30 sec."

The latest news concerning the new "super Zeppelin" which the Germans are building is as follows: "Construction of the super-Zeppelin, the 1, 2, 138, which, according to Dr. Hugo Eckener and its other sponsors, will maintain a regular trans-Atlantic service independent of wind and weather has been begun. Preliminary to mounting its parts the entire Zeppelin works at Friedrichshafen are now being dismantled to make way for the immense buildings in which the balloons of the clouds will be housed."

Then just shows how efficient modern production methods can be. Most of us don't even think about dismantling the building until we get the job all done, and find that the lot is double or even where it is we have built inside the barn, can't be gotten out in any other way.

The prospectus of this new Zeppelin gives a long list of improvements which will be made in this ship with the statement that most of the changes come from their experiences with the Graf Zeppelin. However, we must be in doubt of improving the steamship's quarters and if we recall correctly there was considerable complaint about that version of the Graf Zeppelin on its last trip.

The newspapers are pointing in the fact that the baseball players are in the south again in a state of spring. On Long Island we used to have one case after the other would be left behind when the "Golf" ship at Miami Field made its annual flight, but this ship isn't there any more. We wonder whether it did happen to it? It is too much great to its reward we're willing to let a small water tank the cockpit when it accident.

The Interpol Aviation says that he sees that the government is going to be very strict about flying over the Panama Canal Zone, restricted routes and limited landing fields being required, with proof of necessity for landing landings anywhere else being demanded. He says that his letter has gotten into such disorganized condition lately he has been could land anywhere in the Canal Zone without anyone questioning the necessity for the forced landing.

Recently we saw an incident which proved to us that a certain very popular young man was not losing his standing with the general public as has been frequently prophesied. We saw two thousand people waiting through the deep mud on Carlin Field, Long Island, to get a look at Lindbergh when he landed there, and we noticed later a sign turned over in the middle of the field and the two airplanes who had been in it landed was the flight office, covered with mud, without a word of sympathy or respect from anyone.



The Fokker Reputation

ASK the world's largest airline operators why they buy Fokkers, and they will soon give you the reply. "We choose Fokker because of their performance."

What stands behind this statement? To be so powerful, a reputation must be founded on many years of safe and successful operation. To build such faith, aircraft must prove steadily and consistently over a long period of time. To satisfy so many owners, under such a great variety of conditions, climates and operating conditions, an aircraft builder must deliver the effectiveness of design and construction can such result only from the widest experience in every phase of military and commercial performance. That is reputation!

One of the most extensive airline systems in North Amer-

ica started with a few single-engine Fokkers, later added several planes of other builders, and, based on the positive experience, now use a large fleet of Fokkers exclusively. The biggest operator on the West Coast suggested its passenger line with Fokkers of a type never before built, ordering a fleet of three great Transcons on the Fokker reputation alone. In another case, a great international transportation system* adopted Fokkers at first, and following a signal success, is rapidly increasing its fleet with 740 Transcon airplanes.

The great majority of Fokker owners—whether flying the transport or the training type—accuse us later when the Fokker reputation with their repeat orders.

*Some of them and many other names in regard.

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(Signed) Earl Bailey

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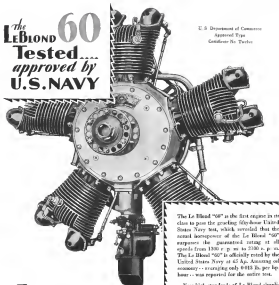
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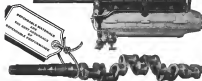
PACKARD



Left: U. S. Navy Martin plane being checked, tested, then mounted on the 800 H.P. Packard engine.

Center: Model A is a 100-hp. H.P. aircraft engine built on the Packard Model C-100 (C-100) engine.

Below: World Champion St. Louis 1934 Packard engine.



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